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SBY, W.S. file	X	X
ANCH, D.B.		
RNIVAL, G.J.		
VIS, J.G.		
RRERA, D.W.		
AY, R.E.		
IS, J.A.		
OVER, W.S.		
LAN, P.M.		
NNI, B.J.		
ARMAN, L.K.		
EALY, T.J.		
DAHL, T.		
BIG, J.G.		
TCHINS, N.M.		
CKSON, D.T.		
LL, R.E.		
ESTER, A.W.		
RX, G.E.		
DONALD, M.M.		
KENNA, F.G.		
NTROSE, J.K.		
RGAN, R.V.		
TTER, G.L.		
ZUTO, V.M.		
ING, T.L.		
NDLIN, N.B.		
HWARTZ, J.K.		
TLOCK, G.H.		
EWART, D.L.		
GER, S.G.		
BIN, P.M.		
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PLY TO RFP CC NO:

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PPROVALS: WSB

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9 (Rev. 6/94)

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November 30, 1994

94-RF-11904

Scott R. Grace
Environmental Restoration Division
DOE/RFFO

TRANSMITTAL OF OPERABLE UNIT 2 DRAFT FINAL TECHNICAL MEMORANDUM NO. 5: EXPOSURE SCENARIOS COMMENT RESPONSES - WSB-139-94

Action: Review and respond

Enclosed are responses to Department of Energy comments on Technical Memorandum 5. Please review the responses and provide any changes by December 9, 1994.

Should you have any questions, please contact Pete Laurin at extension 8702.

W. S. Busby
Manager, OU-2 Closure
Environmental Restoration Program Division

PL:pap

Orig. and 1 cc - S. R. Grace

Enclosure:
As Stated

cc:
E. A. Dille - SAIC

ADMIN RECORD

RZ-A-00121

Response to DOE Comments on OU2 Technical Memorandum No. 5, "Exposure Scenarios"

Comments from Rick Stupka to Scott Grace:

Comment 1. The residential scenario should discuss sensitive subpopulations in a more complete way directed to satisfying CDPHE.

Response: The Exposure Assessment TM indicates that child residential intakes are being estimated for the soil ingestion exposure pathway and that additional potentially complete pathways for children in a residential scenario may be evaluated qualitatively in the uncertainty section of the HHRA. These evaluations should satisfy EPA and CDPHE requirements for discussing potential sensitive subpopulations in the HHRA. It should also be noted that EPA toxicity values used for chemicals of concern in the HHRA are generally considered to be protective of sensitive subpopulations. For example, chronic RfDs are defined as estimates of daily exposure levels for the human population, including sensitive subpopulations, that are likely to be without an appreciable risk of deleterious effects during a lifetime. Text was not amended.

Comment 2. The COC TM is done. It would be a great help in understanding the need for certain exposure scenarios if these COCs were listed. I had a particular problem with the category of "external irradiation". Each TM should not be done in a vacuum, but rather should build on its predecessor documents.

Response: Potential chemicals of concern identified for surface soil, subsurface soil, and groundwater are discussed in detail in the COC TM. COCs were identified for each media being assessed in the Exposure Assessment TM. COCs in surface and subsurface soil include radionuclides. In the Exposure Assessment TM, where complete exposure pathways are listed (Section 4.4), the "external irradiation" pathway is described as "external irradiation from decay of radionuclides in surface or subsurface soil." Text was not amended.

Comment 3. I do not understand how radioactive decay can be viewed as a release mechanism. If you are referring to the release of ionizing radiation, the effect in this specific case is negligible. The COCs in question are primarily an inhalation hazard, so release mechanisms associated with them would primarily involve vectors to the respiratory tract of a receptor. Counting decay as a release mechanism is confusing.

Response: The term "radioactive decay" in the Exposure Assessment TM refers to the release of ionizing radiation. Although potential hazards from this specific release mechanism are probably relatively small, pathways associated with this release mechanism will be evaluated in the HHRA for completeness. Text was not amended.

Comment 4. Does the ecological reserve scenario anticipate the reintroduction of T&E species into the wild? The discussion on page 2-10 seems to imply this possibility. Please clarify.

Response: The discussion on page 2-10 indicates that the habitat in the buffer zone at RFETS is potentially suitable to a number of plant and wildlife species of concern, and refers to several species that are native to northern Colorado and who may or may not currently inhabit the open space area within and immediately adjacent to the RFETS buffer zone. The statement was not intended to imply future, artificial reintroduction of T&E species into the wild. Text was not amended.

Comment 5. Section 3-2 describes potential receptors. Are these descriptions standard among all the OUs? This is a requirement of the Risk Assessment policy (RFI 5480.3). All information should be standardized in the TMs where ever possible. If a standard document exists that contains a compendium of all the information common among the OUs, this document should be referenced. If it does not exist, ER should be tasked with compiling one.

Response: The description of receptors in OU2 is standard to RFETS and has been used as a template for other OUs. No standard document fitting the above description currently exists. Text was not amended.

Comment 6. External irradiation to a gravel miner from subsurface soil is even less credible than from surface soil, due to the orders of magnitude lower concentrations in surface soil. Analysis employing these scenarios will be very difficult to defend on a technical basis.

Response: Due to the very low contact of a gravel miner with surface soils, the gravel miner will be exposed only to subsurface soils for purposes of calculating risk. External irradiation is being assessed for completeness.

Comment 7. Do the groundwater wells in the area prove sufficient to supply a residential user? It is my understanding that they do not, and that fact makes most of the pathways for the residential user incomplete.

Response: The No. 1 Sandstone formation in OU2 is a potential source of groundwater for hypothetical future on-site residents. CDPHE and EPA have each

indicated that evaluation of risk from domestic use of on-site groundwater is a requirement for the on-site residential scenarios. Additionally, EPA has stated that arguments suggesting that the available quantity of groundwater at RFETS will not support certain withdrawal rates do not form an acceptable basis for excluding domestic use of on-site groundwater as a potential exposure pathway. Text was not amended.

Comment 8. Page 5-5. ER term is missing something, and I believe its "Sv/hr".

Response: The units for ER as it is defined are correct in the text. However, the equation for ER and the discussion that immediately follows on p. 5-5 would be more clear with the following changes (see attached p. 5-5). Text will be revised accordingly.

$ER = C * 10^3$ g/kg * SD * D * (1 - Se) * Te

Effective dose equivalents (Sv) are estimated by multiplying ER (pCi/m^2 soil) by the areal external dose conversion factor for specific radionuclides (Sv/hour per pCi/m^2).

Comments from SAIC:

GENERAL

Comment: DOE must make a decision as to whether or not future land use scenarios that are unlikely, such as future commercial/office worker and future residents, are to be evaluated in the HHRA. Currently, the HHRA is looking at future on-site residents, but in OU1 CDPHE discarded the work done in the HHRA all together. Suggest treating the future on-site commercial/office worker the same as the hypothetical future on-site resident by stating that the scenario is unlikely but will be evaluated in the HHRA. The entire document should then be revised accordingly.

Response: The Exposure Assessment TM indicates that future on-site land use at RFETS may involve industrial or office complexes at the developed portion of the plant and open-space uses in the buffer zone. Additional commercial/industrial development at RFETS, adjacent to developed portions of the site, in proximity to existing structures and infrastructures, is considered credible. Since AOC No. 1 is comprised of industrial land use areas as well as land adjacent to these industrial areas, it is felt that industrial or office complex land use in AOC No. 1 is credible. Thus, the HHRA for OU2 will assess exposure of future industrial/office workers in

AOC No. 1 (all), AOC No. 1 (30-acre maximum exposure area), and, for completeness, in AOC No. 2 (all). Text was not amended.

Comment: The locations of the 30-acre commercial/office worker grid and the 50-acre ecological grid as presented in Figure 3-3 were not agreed to by DOE, EPA, or CDPHE. Suggest a meeting to reach consensus on these locations.

Response: 10-acre, 30-acre, and 50-acre areas in OU2 that are expected to pose the maximum risk to human health were selected to represent maximum exposure scenarios for future on-site residents, industrial/office workers, and ecological researchers, respectively. The 10-, 30-, and 50-acre areas are being assessed because each exposure scenario is being evaluated in each AOC. The 10-, 30-, and 50-acre areas include the maximum contaminated portions of OU2, and therefore their locations are consistent with the maximum exposure area methodology agreed upon by DOE, CDPHE, and EPA. Text was not amended.

EXECUTIVE SUMMARY

Comment: p. ES-3, 1st par: Suggest referencing Figure 3-2 here when discussing AOCs 1 and 2.

Response: The text is amended to read "Exposures of current and future on-site receptors is evaluated in HHRA at two areas of concern (AOCs) in OU2 (Figure 3-2)."

Comment: p. ES-3, 2nd par: In earlier meetings between DOE, CDPHE, and EG&G an agreement was reached to only assess the future on-site resident in a 10-acre plot in the 903 Pad Area. This evaluation was agreed to with the Agencies during the 10-acre grid location determination. However, DOE wants to present only those future land use scenarios that are highly likely such as the ecological researcher. Such a land use designation would preclude the evaluation of the industrial/office workers in a 30-acre grid.

Response: To be consistent with the AOC-wide exposure scenarios, the 10-, 30-, and 50-acre plots are being assessed in AOC No. 1 (see also response to GENERAL comment above). Text was not amended.

Comment: p. ES-3, 3rd par., first sen.: If direct contact with soil is a release mechanism, does this include dermal contact and direct ingestion? Please clarify.

Response: The text is amended to read "Potential release mechanisms from contaminated soil in OU2, identified in the CSM, include storm water runoff, volatilization, wind suspension, infiltration and percolation to groundwater, direct oral and dermal contact with soil, root uptake, and radioactive decay."

Comment: p. ES-3, last paragraph: Suggest one or two sentences here explaining that EPA default intake factors were used if available, otherwise a central tendency intake factor was developed and used for those analytes that do not have an EPA default value. This discusses WHY central tendency values were used.

Response: For the RME condition, when EPA default values were not available, upper-bound estimates of intake factors were used. Central tendency estimates of intake were presented in the Exposure Assessment TM in addition to RME estimates of intake because EPA prefers that risk assessments address both central tendency and high-end portions of the risk distribution. Text was amended to read "Quantitative values for exposure factors to be used for estimating central tendency and reasonable maximum chemical intake are identified for each of the potentially complete exposure pathways and receptors, as recommended by EPA (EPA 1992)."

SECTION 1

No comments

SECTION 2

Comment: p. 2-2, sec 2.2, last sentence.: Add the "...Phase II..." after the words Preliminary Draft.

Response: The text is amended to read "More detailed information can be found in the Phase II RFI/RI Work Plan (EG&G 1991a) and the Preliminary Draft Phase II RFI/RI report (DOE 1993)."

SECTION 3

Comment: p. 3-4, last par.: The discussion presented here suggests that commercial/office worker future land use is not a probable land use in the contaminated areas of OU2. However, discussion should be added stating

that the entire area of OU2 is not a likely candidate for commercial/office worker future land use (see also comment above P. ES-3, 2nd par.).

Response: The Exposure Assessment TM indicates that future on-site land use at RFETS may involve industrial or office complexes at the developed portion of the plant and open-space uses in the buffer zone. Additional commercial/industrial development at RFETS, adjacent to developed portions of the site, in proximity to existing structures and infrastructures, is considered credible. Since AOC No. 1 is comprised of industrial land use areas as well as land adjacent to these industrial areas it is felt that industrial or office complex land use in AOC No. 1 is credible. Thus, the HHRA for OU2 will assess exposure of future industrial/office workers in AOC No. 1 (all), AOC No. 1 (30-acre maximum exposure area), and, for completeness, in AOC No. 2 (all). Text was not amended.

Comment: p. 3-5, 2nd par., 1st sen.: The statement "...and DOE land use plans..." needs further substantiation. Please add rationale for DOE's intended land use (i.e., any applicable documents, land use working groups, etc.).

Response: The text is revised to read "In summary, future on-site residential development is inconsistent with land use plans for the area."

Comment: p. 3-5, 2nd par, 3rd sen.: Future on-site commercial/office worker scenario may not be applicable for OU2 even though this scenario is viable for the plant area. Present future land use scenarios for evaluation that are most likely to actually occur (i.e., ecological researcher).

Response: See response to GENERAL comment above. Text was not amended.

Comment: p. 3-6, top of page, 1st sentence: Please explain why future on-site gravel miner would contact surface soils.

Response: This exposure scenario was re-evaluated, and will address chronic exposure of gravel miners to subsurface soil only because surface soil exposure is not chronic for this occupation. Text will be amended accordingly.

Comment: p. 3-6, sec. 3.3, 2nd par., 3rd sen.: Change word "High" to elevated.

Response: The text is amended to read "Elevated maximum concentrations of chlorinated hydrocarbons have been detected in groundwater from 903 Pad, Mound, and Northeast Trenches source areas."

Comment: p. 3-8, 2nd sen.: Delete or further define the word conservative.

Response: The text is amended to read "The modeling will yield estimates of chemical concentrations in surface water in Walnut and Woman creeks at Indiana Street ..."

SECTION 4

No comments

SECTION 5

Comment: p. 5-1, 1st par.: Add short discussion as to WHY we are using central tendency intake factors where such factors are applicable.

Response: As a matter of policy, EPA expects risk assessments to address central tendency and high-end portions of the distribution for individual risk. Because this approach is expected, it is not necessary to discuss the reasons for including central tendency exposure estimates. However, text was amended to read "Intakes are estimated for average CT and for RME conditions, as recommended by EPA (EPA 1992).

TABLES

Comment: Table 3-1: Suggest that the future on-site land use for commercial/industrial be changed to improbable. See also comment above p. ES-3, 2nd par.

Response: See response to GENERAL comment above. Text was not amended.